A new species in the genus *Coptotettix* (Orthoptera: Tetrigidae: Tetriginae) from northern Thailand

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Abstract: *Coptotettix acutiangulus* Zha sp. nov. from northern Thailand is described and illustrated with photographs. Morphological differences with a similar species *C. annandalei* are described in detail. *C. acutiangulus* Zha sp. nov. may be potentially distributed in Nepal. A brief discussion of the ecology and habitat of *C. acutiangulus* is given.

Key words: Tetrigoidea; ecology; habitat; pygmy grasshopper

泰国北部柯蚱属一新种 (直翅目：蚱科：蚱亚科)

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摘要：记述采自泰国北部的柯蚱属 1 新种：尖角柯蚱 *Coptotettix acutiangulus* Zha sp. nov. 并附以照片，且与近似种安氏柯蚱 *Coptotettix annandalei* 做了详细的形态学比较，该新种可能同时分布于尼泊尔；文章还对尖角柯蚱的生态学及习性做了简要讨论。

关键词：蚱总科；生态学；栖息地；蚱

Introduction

The genus *Coptotettix* (Orthoptera: Tetrigidae: Tetriginae) was established by Bolívar in 1887, Kirby (1910) subsequently designated its type species as *C. asperatus* Bolívar, 1887 collected from Vietnam (Cochin China). Currently the genus includes 74 species (Eades *et al.* 2016) which are widely distributed in tropical and subtropical Africa, Asia and Australia (Zheng *et al.* 2013; Storozhenko & Dawwrueng 2015). Among them only 2 species (*C. annandalei* Hancock and *C. conspersus* Hancock) have been recorded from Thailand (Storozhenko & Dawwrueng 2015).

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C. annandalei was originally described by Hancock (1915), and later Shishodia (1991) described some of its geographic variations. Prof. Ingrisch provided pictures of two specimens of *C. annandalei*: one is a female and was collected from China (Guangdong), the other is a male and from Nepal (Terai) (Eades *et al.* 2016). Morphologically, the two specimens are distinctly different: the former is consistent with descriptions of Hancock (1915) and Shishodia (1991) while the latter is similar to *C. acutiangulus* sp. nov. that is described as follows. Ingrisch (2001) thought that the male from Nepal might be an undescribed species, but the material at hand was not enough to distinguish.

In this paper, we introduce a new species in the genus *Coptotettix* from northern Thailand. *C. acutiangulus* Zha sp. nov. is described, illustrated with photographs and compared with its most similar species, *C. annandalei*, in detail. The ecology and habitat of the new species are also discussed.

Taxonomy

***Coptotettix acutiangulus* Zha sp. nov.** (Figs. 1, 2)

Male. Body size small and stout; face, ventral surface of body, fore and middle legs, and subgenital plate covered with many long hairs (Fig. 1).

Vertex below level of anterior margin of pronotum, equal to one eye in width, slightly narrowed forward, fossulate on each side and slightly uplifted on occiput; anterior margin straight and a little low, protruding forward but not reaching anterior margins of eyes, lateral margin distinctly folded upwards but not up to top of eyes; median carina distinct and protruding, extending to occiput; in profile, vertex together with frontal ridge arcuate and slightly visible before eyes, not concave between lateral ocelli, arcuate and protruding forward between bases of antennae, and concave at median ocellus (Fig. 2B); in frontal view, longitudinal furrow slowly divergent downward, width between bases of antennae slightly narrower than diameter of first segment of antenna; antenna filiform and 14 segmented, segments VII–IV longest, 5.5 times as long as wide, inserted a little below lower margins of eyes (Fig. 2C); eyes globose and protruding, distinctly over the level of anterior margin of pronotum; lateral ocellus situated nearly (a little below) middle of inner margin of eye.

Pronotal disc relatively flattened, covered with many small and low tubercles and numerous fine granules. Anterior margin of pronotum truncate but behind eyes a little shallowly concaved inward, between and before shoulders pronotum slightly uplifted; hind process tapered, reaching but not surpassing antegenicular denticle of hind femur, the distal end horizontal or curved upward or downward, apex sharp; mid-keel of pronotum entire and distinct, between sulci compressed and distinctly elevated with swollen base, behind shoulders nearly straight or slightly undulate; lateral carina finely serrulate, interrupted behind tegmen, the anterior part reflexed downward and becoming external lateral carina which combines together with the lower marin of pronotum before top of hind process; lateral keels of prozona distinct, finely serrulate, parallel and short, 0.5 time as long as the width between them; humeral angles obtusely angled and slightly depressed, abbreviated carina between shoulders absent; posterior angle of lateral lobe of pronotum extending obliquely backward and slightly produced outwards, apex round-sharp, posterior margin of each lateral lobe with two concavities. Visible part of tegmen long-oval, 2.8 times as long as wide, apex rounded; wings a little degenerate, distinctly not reaching top of hind process (slightly surpassing middle of hind femur) (Fig. 1).

Fore femur slightly cylindrical, upper and lower margins straight and a little finely serrulate; middle femur extremely compressed, distinctly wider than visible part of tegmen, upper and lower margins with little undulations and finely serrulate; hind femur stout, 2.5 times as long as wide, upper and lower margins distinctly finely serrulate, antegenicular denticle large and high, triangular; genicular denticle fingerlike and extending backward and apex truncate or subtruncate; hind tibia slightly enlarged from base to end, outer/inner side with 7–9/6–7 spines; first segment of hind tarsus distinctly longer than third (1.35 times), three pulvilli equal in length or third pulvillus longer than first and second, all apices sharp. Subgenital plate cone-shaped and very short, end notched, apex bidentate with two obtuse and very short denticles (Fig. 2D).

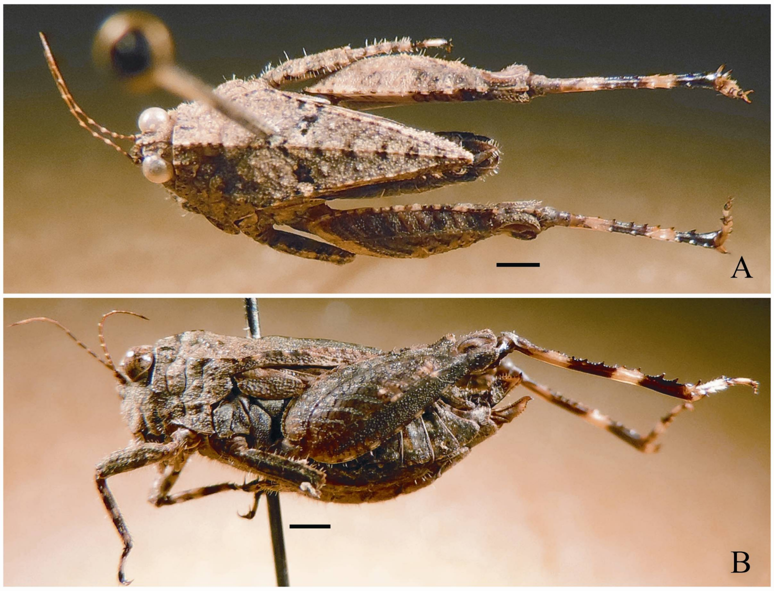

Figure 1. *Coptotettix acutiangulus* Zha sp. nov. A. Male body, dorsal view; B. Female body, lateral view. Scale bars = 1 mm.

Body dark gray and a little dark green, hairs covering body surface golden yellow. Antennae brown, color of the border between segments light, distal segments darker; hind wings dark brown; margins of hind femur spotted with milky white, outer side maculated with milky white, lower outer side mainly black except base; for- and mid-tibiae dark brown and with 3 milky white rings each, hind tibia distinctly black and with 2 elongate yellowish brown rings; sometimes pronotal disc behind shoulder with a pair of big black spots and mid-keel of pronotum maculated with black.

Female. Body size slightly larger than male. Vertex slightly wider (1.15 times) than one eye (Fig. 2A); antenna 15-segmented, segments VIII–V longest. Middle femur not as extremely compressed as that of male, slightly wider than visible part of tegmen. Ovipositor: upper and lower valvulae twisted, upper valvula about 2.5 times as long as wide, outer margins of upper and lower valvulae with small saw-like teeth but basal margins smooth (Fig. 1B);

posterior margin of subgenital plate a little contracted backward, in the middle with a broad triangular protrusion (Fig. 2E).

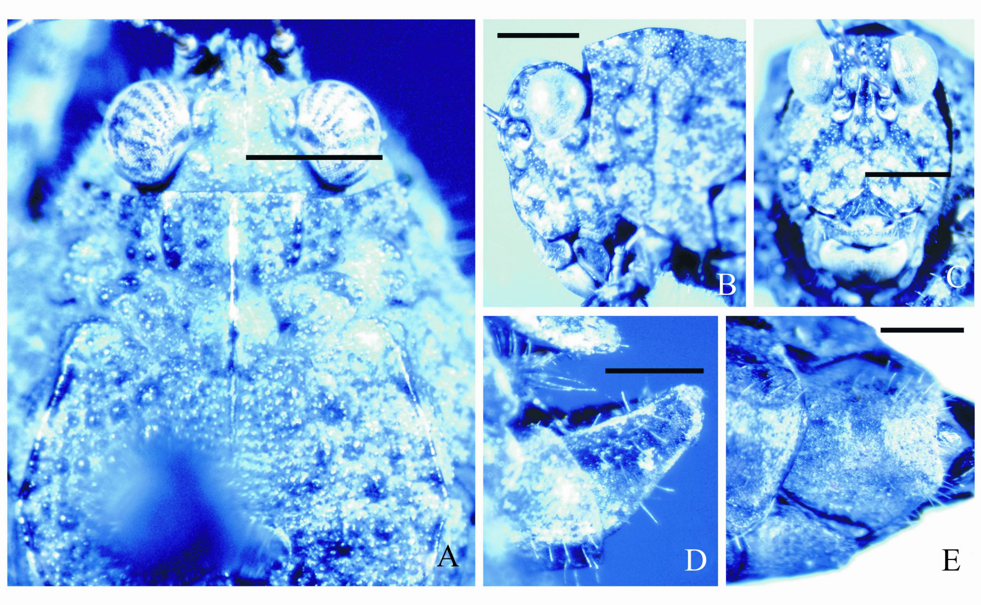

Figure 2. *Coptotettix acutiangulus* Zha sp. nov.. A. Female head and anterior pronotum, dorsal view; B. Male head, lateral view; C. Male head, frontal view; D. Male subgenital plate, lateral view; E. Female subgenital plate, ventral view. Scale bars = 1 mm (A–C), 0.5 mm (D, E).

Measurements. Length of body ♂ 8.0–8.4 mm, ♀ 10.4 mm; length of pronotum ♂ 6.6–6.9 mm, ♀ 7.2 mm; length of hind femur ♂ 5.0–5.3 mm, ♀ 5.6 mm.

Holotype. ♂, **Thailand**, Chiang Rai, Fathai, 20°2′57.71″N, 99°52′43.46″E, alt. 411 m, 30-V-2015, collected by Lingsheng ZHA. **Paratypes**. 2♂1♀, 10-V–20-VI-2015, other data same as holotype. Type specimens are deposited in the Herbarium of Mae Fah Luang University (MFLU), Chiang Rai, Thailand.

Etymology. The specific epithet '*acutiangulus*' is derived from the Latin *acutus* (sharp) and *angulus* (angle), which means the apex of posterior angles of the lateral lobes of pronotum is a little sharp.

Diagnosis. *Coptotettix acutiangulus* sp. nov. is similar to *C. annandalei* Hancock (Hancock 1915; Shishodia 1991; Ingrisch 2001). The former differs from the latter mainly by: 1) lateral keels of prozona parallel and short (Fig. 2A) (contracted backward and longer in *C. annandalei*); 2) humeral angles obtusely angled (Fig. 2A) (obtusely rounded in *C. annandalei*); 3) abbreviated carina on pronotal disc absent (Fig. 1) (abbreviated carinae visible by dots between shoulders in *C. annandalei*); and 4) apex of posterior angle of lateral lobe of pronotum rounded-sharp (Fig. 1) (truncate or subtruncate in *C. annandalei*).

Ecology and habitat. Individuals of *Coptotettix acutiangulus* sp. nov. inhabit an open and humid meadow in a tropical region. The meadow is covered by low weeds and vines and all sorts of humus (Fig. 3) and has usually been submerged by floods in rainy season (generally from end of June to October in northern Thailand). The insect's pronotum is a little green which resembles the weeds or vines growing in their habitat. From the habitat we infer they may mainly feed on varieties of humus. They are very scarce and we can not at all found them in dry season (January to May in northern Thailand) in their habitat.

Distribution. Thailand (Chiang Rai).

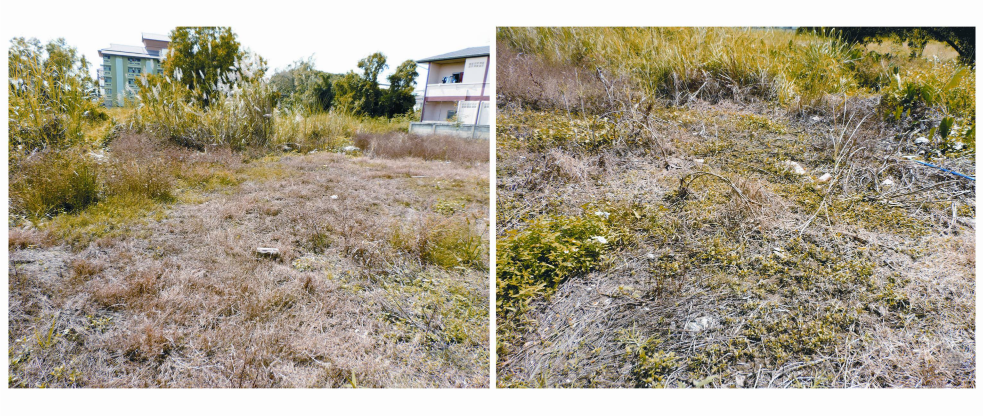

Figure 3. Habitat of *Coptotettix acutiangulus* Zha sp. nov. Pictures were photographed by Lingsheng ZHA in Thailand, Chiang Rai, Fathai (20°2′57.71″N, 99°52′43.46″E, alt. 411 m) on 30-V-2015.

Discussion

Compared to brachypronotal and macropronotal forms of *C. annandalei* (Hancock 1915), collections of *C. acutiangulus* sp. nov. are all brachypronotal; this is consistent with Thai (Phrae) *C. annandalei* reported by Storozhenko & Dawwrueng (2015). Unfortunately they did not provide any other morphological descriptions. Also in *C. annandalei*, the wing does not quite reach, or reaches or slightly surpasses the apex of the hind process (Hancock 1915; Shishodia 1991); but in *C. acutiangulus* sp. nov., the wing distinctly does not reach the top of the hind process (often only slightly surpassing the middle of the hind femur).

This new species is very similar to the photographs of *C. annandalei* from Nepal (Terai) provided by Prof. Ingrisch (Eades *et al.* 2016). Apart from the truncate (but not round-sharp) apex of posterior angle of lateral lobe of pronotum, we cannot find any other differences, so we infer that the specimen in the pictures that was suspected to be an undescribed species by Ingrisch (2001) is in fact *C. acutiangulus* sp. nov..

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